

## POSSIBLE FINE STRUCTURE IN THE DELAYED NEUTRON YIELDS IN THE RESONANCE REGION FOR PU-239

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In the previous conference in Tsukuba, the authors proposed a method of analysis of the variation of the delayed neutron yield (DNY) on the basis of multimodal fission model, in which mass and total kinetic energy distributions of fission fragments were represented as a superposition of standard-1 (S1), standard-2 (S2), standard-3 (S3) and superlong (SL) components. The fission yields were calculated with a superposition of Gaussian functions with relevant parameters, considering the proton even-odd effects on the fission yield. The DNYs were calculated with the summation method using different sets of the DN emission probability data.

Hambsch et al. (1989, 2002) found that there were fluctuations in the branching ratios to different fission modes at resonances for U-235 and Pu-239. These data, combined with the method mentioned above, resulted in fluctuations in the DN precursor yields in the resonance region; this inevitably led to fluctuations in DNY. In the 2002 paper by Hambsch et al. on Pu-239, however, the mass yield difference from the thermal value for each resonance was not obtained, due to experimental difficulty and insufficient statistics; only the mass yield difference summed over  $1^+$ -resonances was found to show a definite structure.

Recently they succeeded in deducing the fission mode branching ratios for each resonance. This made it possible to perform analysis for each resonance separately. The result showed that, for most of  $1^+$ -resonances, the S2 component increases while S1 component decreases; this resulted in local increase in DNY at the resonances, due to contribution of precursors lying near the mass peak of S2-mode. In contrast, for a few resonances, the opposite tendency was observed, which resulted in local dips in DNY at the resonances.